

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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FEDERAL COMMUNICATIONS COMMISSION
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In the Matter of)

Preparation for International)
Telecommunication Union World)
Radiocommunication Conferences)

IC Docket No. 94-31

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REPLY COMMENTS OF
ASSOCIATION OF AMERICAN RAILROADS

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SUMMARY

The Commission issued the present Second Notice of Inquiry to solicit comments for the upcoming 1995 World Radiocommunication Conference. In this Reply Comment the Association of American Railroads expresses its concerns regarding the proposals by NVNG-MSS proponents to allocate additional spectrum for their use below 1 GHz.

The NVNG-MSS proponents' characterization of the use of the fixed and mobile bands is flawed in several respects. It is inaccurate to state that use of those bands is intermittent. Indeed, the fixed and mobile bands are some of the most heavily used bands regulated by the FCC.

The sharing studies advanced by the NVNG-MSS proponents are unreliable for a variety of reasons. They fail to acknowledge the critical safety function of many Private Land Mobile Radio ("PLMR") systems. In addition, they do not recognize the heavy use of the fixed and mobile bands. Moreover, the studies do not factor in the effect of specific domestic regulatory processes, such as the current rechannelization effort. Finally, the evolution of the NVNG-MSS systems, as described by the proponents themselves, would eliminate the ability to rely on key sharing techniques. For all these reasons, AAR urges the Commission not to advocate or support co-primary use by the NVNG-MSS of bands used by the PLMR services.

With regard to MSS feeder links, AAR believes that the Commission should be cautious in allocating spectrum in the 6 GHz

band for such uses. There are already significant demands placed on this band by private operational fixed users and these demands will only increase in the future due to the relocation mandated by the Commission in ET Docket No. 92-9.

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To: The Commission

REPLY COMMENTS OF
ASSOCIATION OF AMERICAN RAILROADS

The Association of American Railroads ("AAR"), by its undersigned counsel and pursuant to Section 1.415 of the Rules of the Federal Communications Commission ("FCC" or "Commission"), hereby submits its Reply Comments in the Second Notice of Inquiry in the above-captioned proceeding (hereinafter "Second Notice"). In this proceeding the Commission invited comments on issues to be addressed at the 1995 World Radiocommunication Conference ("WRC-95").

I. BACKGROUND

In its Comments filed in response to the Second Notice AAR expressed its reservations with the Informal Working Group 2 ("IWG-2") proposals to allocate spectrum below 1 GHz to NVNG-MSS use. In addition, AAR clarified certain misconceptions contained in the IWG-2 Interim Report concerning the use of the Private Land Mobile Radio ("PLMR") frequencies.

AAR disagreed with the IWG-2 assessment regarding the prospect of sharing in the bands IWG-2 identified according to

Priorities One, Two and Three and particularly with regard to those frequencies in Priority Two.¹ AAR addressed the statement in the IWG-2 Interim Report that the land mobile bands are good candidates for sharing with the NVNG-MSS service because their use is "intermittent."² AAR pointed out that simply because many of the land mobile radio systems relied on simplex mode push-to-talk equipment, the systems could not be characterized as intermittent. In fact, for the railroads, usage on many channels is almost constant in nature: "there is almost constant on-the-air dialogue among the yardmaster in the tower, the engineers in the locomotives, and the crews on the ground as cars are pushed, pulled, sorted and moved throughout the train-making process."³ Moreover, the IWG-2 report apparently overlooked the fact that land mobile systems are not just push-to-talk, but also serve vital data and telemetry applications.

AAR expressed concern that these facts were not factored into the sharing studies relied on by the IWG-2, and advanced the view that, until such time as complete and accurate sharing studies were done that fully reflected the nature of the use of the bands identified for possible allocation, there should be no new MSS allocations.

^{1/} The Priority Two bands are 157.0375-174 MHz, 470-512 MHz and 512-806. IWG-2 Interim Report at 17.

^{2/} IWG-2 Interim Report at 15.

^{3/} AAR Comments at 5.

II. THE FIXED AND MOBILE SERVICES ARE HEAVILY USED AND THE CHARACTERIZATION OF INTERMITTENT USE IS MISLEADING

Although many of the commenters in this proceeding repeated the misconception that the fixed and mobile services are intermittent in use, several others expressed an accurate view of the use of the bands.⁴ For example, Motorola, Inc. ("Motorola") explained that while the characterization of intermittent usage

may be true for individual users, when viewed over a larger area, any given channel is in near constant use. Because of the numerous overlapping terrestrial service areas and the size of the satellite downlink "footprint", even short "bursty" communications would likely interfere with co-frequency terrestrial transmissions within line of sight.⁵

Other land mobile users were quick to point out that usage is quite heavy in the "Priority Two" bands identified by the IWG-2 and by various commenters as suitable for allocation to NVNG-MSS.⁶ The attached chart graphically demonstrates the density of railroad base stations alone. In addition to base stations, the railroads utilize 45,000 mobile radios, 125,000 portable

^{4/} Leo One USA Corporation ("Leo One") Comments at 9 ("Fixed and mobile services are generally the most shareable services since the nature of their use is by definition intermittent"); GE American Communications ("GE American") Comments at 10 (stating that fixed and mobile service "both use intermittent signals").

^{5/} Motorola Comments at 18.

^{6/} The Utilities Telecommunications Council ("UTC") noted that there are 15 million transmitters operating nationwide in the bands allocated for PLMR use and that "the 150-174, 450-470 and 470-512 MHz bands are among the most extensively used frequency bands licensed by the FCC." UTC Comments at 5-6. The Association of Public-Safety Communications Officials-International, Inc. ("APCO") echoed these comments when it stated that these "are perhaps the most heavily used frequency bands in the United States." APCO Comments at 5.

radios, 5,500 talking defect detectors and 56,000 end-of-train, head-of-train devices and locomotive mobiles. These figures do not account for the vast number of other PLMR communications systems.

UTC rightfully questioned, therefore, the IWG-2's statement that it had avoided recommending "bands with very heavy civil, industrial and military use."⁷ And Motorola recalled the Commission's own statements in the Refarming Proceeding⁸ that "without significant regulatory changes in the bands below 512 MHz, the quality of PLMRs communications will likely deteriorate to the point of endangering public safety and the national economy,"⁹ concluding that "clearly these realities do not support the examination of additional sharing of these critically important bands."¹⁰

It is curious in this regard that although the NVNG-MSS commenters relied heavily on the findings of Task Group 8/3 to the effect that the demand for their services will grow over the coming years, they ignored the Task Group's conclusion that "[t]he growth of terrestrial cellular mobile networks and other high density land mobile applications will make the relevant bands difficult to share between land mobile and the MSS."¹¹

⁷/ UTC Comments at 6 (citing from IWG-2 Interim Report at 17).

⁸/ PR Docket No. 92-235.

⁹/ Motorola Comments at 16.

¹⁰/ Id.

¹¹/ ITU-R TG 8/3, Doc. 8-3/18 at 13 (July 27, 1994).

Other commenters noted the likely increase in the number of land mobile transmitters operating in these bands as a result of the FCC's current "refarming" efforts. Indeed, UTC estimated that the number of transmitters could increase to 20 million by 1996 and 25 million by 2004.¹² Such an increase in usage would render sharing in these bands all the more problematic.

III. SHARING WITH NVNG-MSS COULD COMPROMISE THE PERFORMANCE OF VITAL SAFETY FUNCTIONS BY THE PLMR SYSTEMS

Of crucial importance is not only the fact that these bands are among the most heavily utilized bands regulated by the FCC, but also that these bands are relied on to perform vital safety functions and, therefore, any interference could endanger both life and property. Motorola stated that, "[t]hese radio services help to save lives; sharing with MSS could imperil these services and, perhaps, undermine the ability of professionals to safeguard the public."¹³ APCO also highlighted the important safety role played by these bands: "In the public safety area, these frequencies provide the bulk of basic land mobile communications networks for police, fire, emergency medical, forestry, highway maintenance, disaster relief, and other critical services."¹⁴

UTC added that

Mobile radio communications is the vital link in virtually all utilities' and pipelines' communications systems. Mobile radio is used for field crew dispatch, nuclear plant security and emergency response communications, hydraulic

^{12/} UTC Comments at 7.

^{13/} Motorola Comments at 17.

^{14/} APCO Comments at 4.

dam flood warning siren and alarm communications, emergency response to gas leaks and electrical outages, and security and safety for transmission line crews and meter readers.¹⁵

AAR also emphasized the vital safety role played by the railroads' communications systems and the seriousness of the threat posed by interference. This paramount safety concern makes evident the need for access to clear channels. AAR said that "even when the use is not constant...it is essential that the channel be kept free and clear of interference during the periods between use so that the channel will always be available for communications in an emergency."¹⁶

The railroads and other private land mobile radio users are justified in their concern about the consequences of sharing with the NVNG-MSS services. Starsys Global Positioning, Inc. ("Starsys") urged that "[t]he NGSO MSS is a new service that should not be subject to regulatory restrictions that have the potential to limit or even curtail user operations in the bands allocated to the services."¹⁷ This attitude casts doubt on the willingness of the NVNG-MSS users to accommodate the concerns of the incumbent users in a sharing environment. If the NVNG-MSS proponents believe they will be wrongly "encumbered with certain constraints to provide protection to existing users of the allocated bands," the PLMRS users have good reason to be

^{15/} UTC Comments at 4.

^{16/} AAR Comments at 5.

^{17/} Starsys Comments at 3.

concerned that their needs will be protected.¹⁸ Adding to that concern, in light of the limited scope of the studies to date, is the lack of any demonstrated effectiveness of channel sharing techniques. In this regard, ITU-R Document M.1039 acknowledges that, "for the purposes of this methodology, the efficiency of the dynamic channel assignment process can not yet be predicted."¹⁹ In light of the safety concerns and heavy usage of these bands, allocations should not be made until such time as the efficiency of all proposed channel sharing techniques is well documented.

IV. THE SHARING STUDIES PERFORMED BY THE EARLY NVNG-MSS USERS DO NOT ACCOUNT FOR THE HEAVY USAGE OF THE PLMR BANDS, THEIR VITAL SAFETY ROLE, NOR THE EVOLUTION OF THE NVNG-MSS SYSTEMS

Notwithstanding the claims by the NVNG-MSS proponents, there are serious doubts about the reliability of the existing sharing studies as a guide to allocation in the PLMR bands. E-SAT claimed that the frequency chart in the Industry Advisory Committee ("IAC") Interim Report "is the result of a great deal of analysis of the feasibility of using selected frequency bands."²⁰ Leo One maintained that "[a] significant amount of work has been done by the early NVNG MSS applicants within the

^{18/} IWG-2 Interim Report at 11.

^{19/} Recommendation ITU-R M.1039, Method for Evaluating Sharing Between Stations in the Mobile Service Below 1 GHz and Spread-Spectrum LEO Systems in the Mobile Satellite Services (1994) (hereafter ITU-R M.1039).

^{20/} E-SAT Comments at 5.

ITU-R to demonstrate the ability of their systems to share with fixed and mobile users."²¹ And Starsys asserted that "[t]he IAC correctly determined that from an objective technical standpoint, bands occupied by the fixed and/or mobile services...are the most attractive candidates for NGSO MSS use", although it did acknowledge that "there may not be enough time to complete the evaluations that will be required to support allocations at WRC-95."²²

The existing sharing studies are unreliable guides to allocation in the fixed and mobile bands because they fail to factor in the vital safety concerns of PLMR systems. It is precisely the possibility that the "dynamic channel assignment schemes" relied on by such commenters as Leo One could search out open channels and insert their messages that poses such a significant threat to railroad safety.²³ In the FCC's Refarming Proceeding, supra, AAR discussed the requirement of immediate access to assigned frequencies:

Safety concerns dictate that the frequencies assigned to a given railroad be available for use at all times. The vital nature of communications on railroad channels -- information that could prevent a derailment -- requires that frequency availability be as close to 100 percent as possible...Even if a railroad channel is not actively transmitting information at any given time, it still is being utilized. For example, radio-based safety devices, such as trackside defect detectors, do not continuously transmit information on the channels assigned for their use, but they must have immediate access to such channels in the event of a defect.

^{21/} Leo One Comments at 9.

^{22/} Starsys Comments at 9.

^{23/} Leo One Comments at 9.

If the channel were not available, the relay of information that would prevent a derailment would be disrupted.²⁴

The Federal Railroad Administration underlined these concerns in comments filed before the FCC supporting continued authorization of the Railroad Radio Service: "Having ready access to this communications medium and avoiding conflicting transmissions that can lead to confusion or operational error is very much in the interest of communities through which railroads operate as well as rail passengers."²⁵ The insertion of even a brief transmission into an open channel in a railroad's communications system could, therefore, pose a grave threat to the safety of life and property.

Not only is reliance on the sharing studies misplaced because they fail to factor in the vital safety role and heavy usage of the PLMR services, but they also fail to take into account the evolution of NVNG-MSS services. Leo One recognized that the studies were performed by early NVNG-MSS applicants.²⁶ As Leo One and other commenters pointed out, however, the nature and range of services to be provided by the second generation NVNG-MSS services will be different in many significant ways. The range of services will be much broader and some of the services to be offered, such as fax transmissions and computer

^{24/} AAR Comments in PR Docket No. 92-235 (filed May 27, 1993) at 16-17.

^{25/} Federal Railroad Administration Comments in PR Docket No. 92-235 (filed July 13, 1994).

^{26/} Leo One Comments at 9.

data transfers, do not fall within the short bursty category of transmissions which were the focus of the ITU-R studies.²⁷

UTC rightly directed attention to the portion of the IWG-2 report which stated that the NVNG-MSS providers want to be able to offer "transmission of longer messages, data/information files, facsimile and similar services" and that future allocations must be able to accommodate this expansion."²⁸ This expansion of services would eliminate the ability to rely on three key sharing techniques: (1) brief message duration, (2) low duty cycle and (3) low data rate. Moreover, as GE American noted in its comments, "[i]t will take years to design, build and implement systems to provide these systems."²⁹ These systems are at an early stage of design when little is known regarding operation on shared frequencies. Further allocations at this time are, therefore, premature.

The concern regarding the inadequacy of the existing sharing studies is captured in various comments by the NVNG-MSS users themselves. For instance, GE American asserted that because "fixed and mobile services employ base stations of 50 Watts or less...[t]hose NVNG systems that operate using spread spectrum

^{27/} Recommendation ITU-R M.1087, Method for Evaluating Sharing Between Stations in the Mobile Service Below 1 GHz and FDMA Non-Geostationary-Satellite Orbit Mobile Earth Stations (1994) and ITU-R M.1039.

^{28/} UTC Comments at 8 (citing from the IWG-2 Interim Report at 16).

^{29/} GE American Comments at 9. The Leo One Comments repeat this timeframe at 5.

technique can, therefore, operate in broad sections of the band without causing harmful interference to voice users" (emphasis added).³⁰ This statement, however, ignores the large percentage of the PLMR systems engaged in data transmission, such as the defect detection devices, end-of-train telemetry devices, and other railroad data uses.

Moreover, the studies did not specify whether they considered the effect of the current rechannelization effort. ITU-R 1039 stated that systems relying on the dynamic channel assignment method will be able to achieve "significant frequency separation (15 KHz or less) between the MSS transmission and the mobile station receiver centre frequency."³¹ Any rechannelization plan will reduce this "expected" degree of frequency separation, leading to a greater possibility of interference. The comment of Leo One to the effect that "the same dynamic channel assignment schemes that work in the 148-149.9 MHz band will work in other fixed and mobile bands" because they have the same 25 KHz channelization is, therefore, misleading because the refarming efforts will reduce channel bandwidth.

V. THE COMMISSION SHOULD EXERCISE CAUTION IN MAKING ALLOCATIONS FOR MSS FEEDER LINKS IN THE 6 GHz BAND

The IWG-4 in its Interim Report suggested the 6.65-6.725 GHz

^{30/} GE American Comments at 10.

^{31/} ITU-R M.1039 at 19. The study goes on to acknowledge that "the efficiency of the dynamic channel assignment process can not yet be predicted."

band as one of many to be considered for allocation for MSS feeder links, although it did acknowledge that the shareability of the band with other systems was a factor that needed to be considered in any allocation decision.³² The Commission in its Second Notice solicited comments on allocations for MSS in the 6 GHz band, among others. AAR recommends that the Commission proceed with caution in allowing any additional use of that portion of the 6 GHz band that currently is used for fixed point-to-point microwave. The 6 GHz band is already heavily occupied by private operational fixed users, and this use will increase in the future as systems are relocated from the 2 GHz band. The Commission has itself recognized that the 6 GHz band is a prime candidate for relocation of the displaced fixed microwave links in the 1.85 to 2.2 GHz band reallocated for use by emerging technologies as a result of ET Docket No. 92-9, including PCS and MSS.³³ Also, and most importantly, the Commission acknowledged that the success of the 2 GHz relocation process, and hence achievement of the Commission's goal of facilitating rapid implementation of new technologies and services in the 2 GHz band, was critically dependent upon the availability of replacement facilities for the fixed microwave incumbents

^{32/} IWG-4 Interim Report at 3.

^{33/} First Report and Order and Third Notice of Proposed Rulemaking, ET Docket No. 92-9, 7 FCC Rcd 6886, 6892, at para. 35 (1992).

presently occupying the 2 GHz band.³⁴ Indeed, the Commission specifically recognized that "if comparable facilities cannot be provided, [then the 2 GHz fixed microwave incumbents] cannot be required to relocate."³⁵ Under the circumstances, the Commission should proceed with caution in the face of proposals to reallocate portions of the 6 GHz band for MSS feeder link use lest the success of the emerging technologies deployment in the 2 GHz band be jeopardized or delayed by the inability to construct "comparable facilities" in other bands.

VI. CONCLUSION

PLMR users have made clear their concerns regarding allocations of spectrum below 1 GHz to the NVNG-MSS users. Because the existing sharing studies do not reflect certain key variables, as discussed above, they should not be relied on to justify new allocations. Instead, further allocations should wait until such time as sharing studies are completed that not only reflect accurate technical data, but also reflect the vital safety role played by the PLMR services. For these reasons, AAR urges the Commission not to advocate or support co-primary use by the NVNG-MSS of bands used by the PLMR services. Also, AAR urges the Commission to proceed with caution in considering any

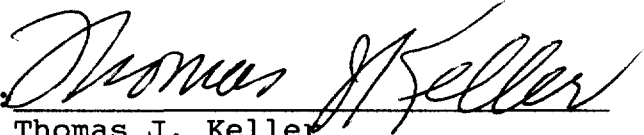
^{34/} Third Report and Order and Memorandum Opinion and Order and Memorandum Opinion and Order, ET Docket No. 92-9, 8 FCC Rcd 6589, 6595 at N. 17, 6603 (1993).

^{35/} Id. The question of whether facilities are "comparable" involves consideration of factors such as "system reliability, capability, speed, bandwidth, throughput, overall efficiency, bands authorized for such services and interference protection." Id. at 6603-04.

additional use of the fixed microwave 6 GHz band given the interrelationship between the availability of that band for fixed microwave relocation and the successful achievement of the Commission's goals for the development of new services as a result of its decisions in ET Docket No. 92-9.

Respectfully submitted,

ASSOCIATION OF AMERICAN RAILROADS

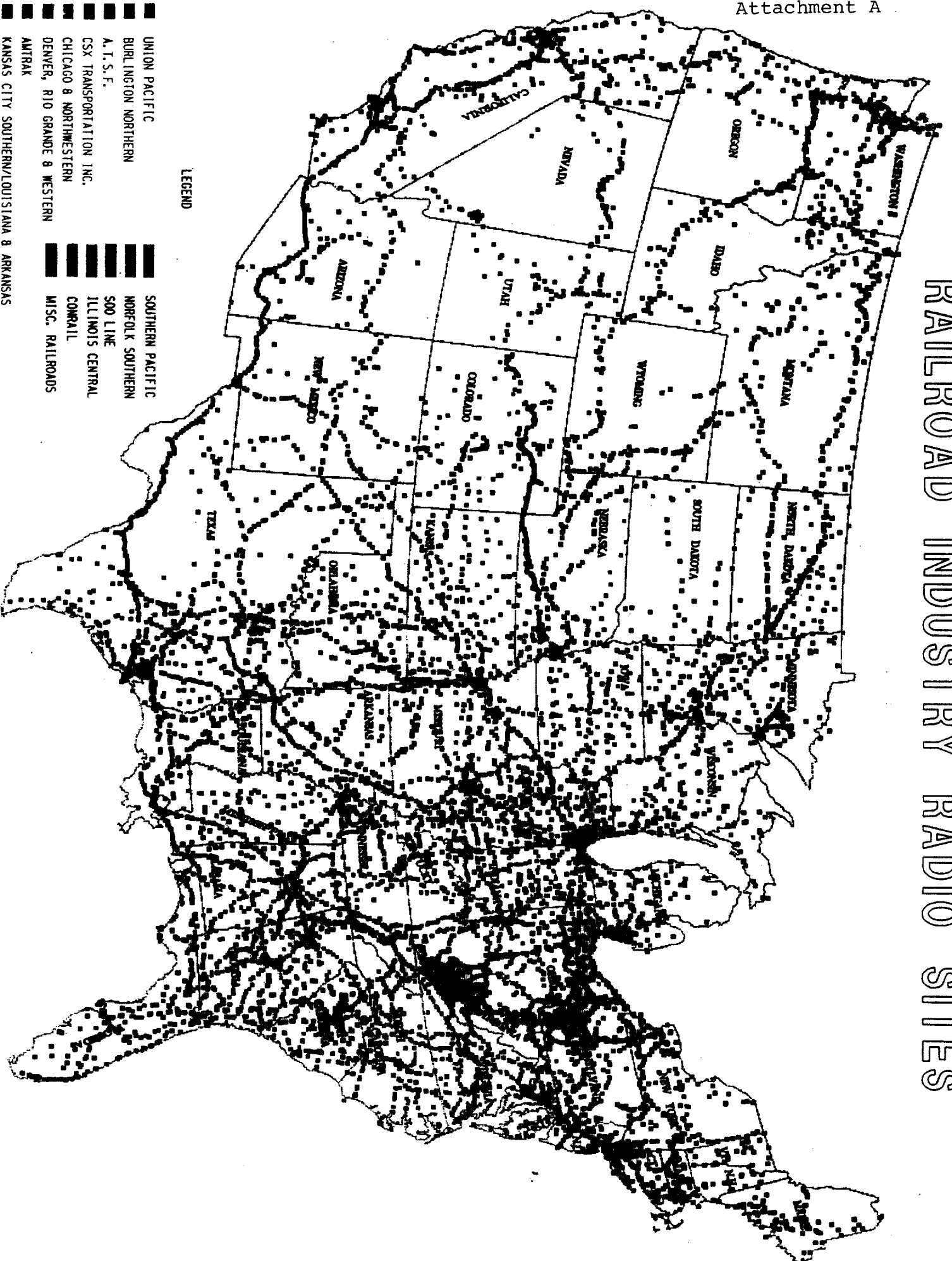
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April 14, 1995

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